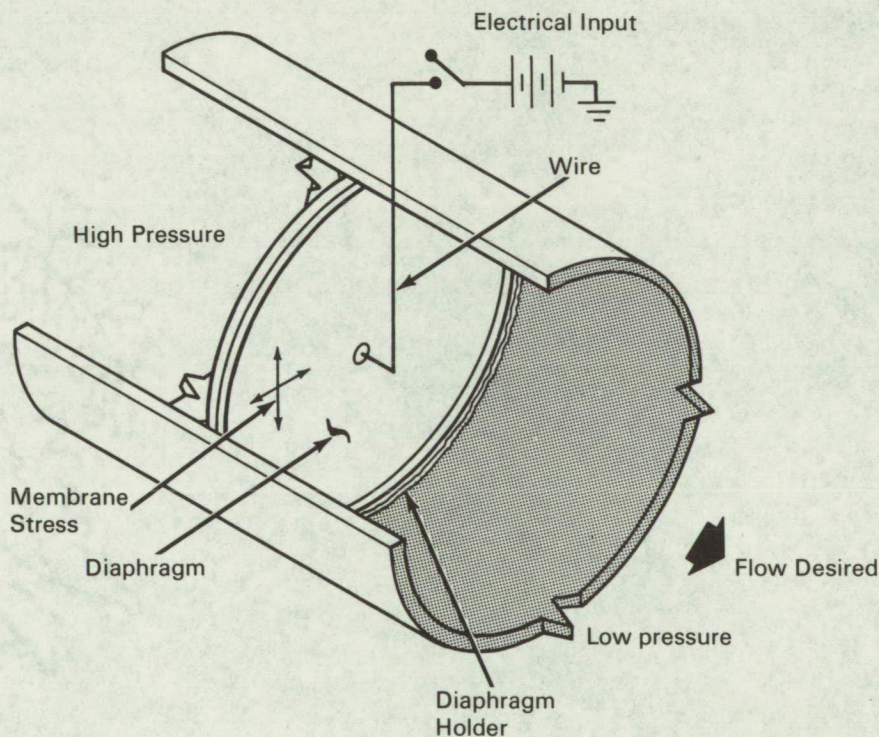


NASA TECH BRIEF



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Electrically Heated Diaphragm Eliminates Use of Pyrotechnics



The problem: In certain systems it is necessary to contain fluids under pressure until a certain pressure threshold or point in time has been reached when the fluids are to be automatically released, often remotely. In the past, the most frequent method has employed pyrotechnics that are dangerous in some applications and have proven unreliable at times due to misfires.

The solution: A membrane-type diaphragm that is resistance heated until its strength is degraded to the point of rupture, thus releasing the contained fluid.

How it's done: At the appropriate point in time or pressure, electrical energy in the form of resistance

heating is applied to the downstream surface of a burst diaphragm. The electrical energy, applied to the diaphragm under membrane stress, is sufficient to degrade the strength of the diaphragm so that it ruptures and releases the pressurized gas or liquid that it had restrained.

Notes:

1. This innovation could be applied in deep submergence vehicles, oil field instrumentation and formation survey equipment, and hydraulic cooling and fuel systems.

(continued overleaf)

2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
P.O. Box 1537
Houston, Texas, 77001
Reference: B65-10400

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated by NASA.

Source: Robert C. Mathewson of North American Aviation, Inc., under contract to Manned Spacecraft Center (MSC-241)